Figure 10a - Input / output characteristics of logical relation classifier
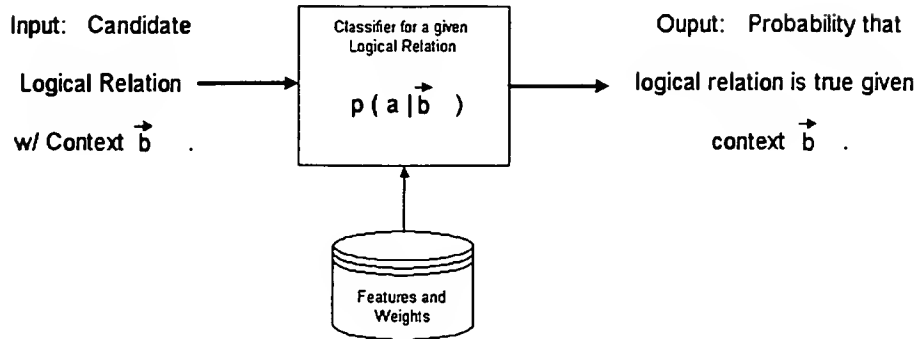
Input: Candidate

Logical Relation ⟶

w/ Context $\vec{b}$.

Classifier for a given
Logical Relation

$p(a\,|\,\vec{b}\ )$

⟶

Ouput: Probability that

logical relation is true given

context $\vec{b}$.

Features and
Weights

Figure 10b - Functional form of the probability distribution model.

Maximum Entropy Model used for parser / Semantic Interpreter

$$p(a\,|\,\vec{b}) = \frac{1}{Z(\vec{b})} \bullet \exp\left\{\sum_{1}^{n} \lambda_i f_i(a,\vec{b})\right\}$$

λ_i = weighting factor for feature i (Computed from training example statistics)

$Z(\vec{b})$ = normalization factor to assure that the probability is within the range 0.0 to 1.0

Figure 10c - Definition of a binary-valued feature function to support (i) positive evidence and (ii) negative evidence

(i) $f(a,\vec{b}) = \begin{cases} 1 & if(a = 1)\,\&\,\left(b_2 = true\,\&\,b_6 = true\,\&\,b_8 = false\right) \\ 0 & otherwise \end{cases}$

(ii) $f(a,\vec{b}) = \begin{cases} 1 & if(a = 0)\,\&\,\left(b_2 = false\,\&\,b_7 = true\,\&\,b_8 = true\right) \\ 0 & otherwise \end{cases}$